Department of Energy
Washington, DC 20585

April 9, 2001

MEMORANDUM FOR DISTRIBUTION

FROM: Theodore A. Wyka, Director
Safety Management Implementation Team

SUBJECT: ISM Performance Measures – Fourth CY 2000 Quarterly Report

Please find attached the quarterly report on the ISM Performance Measures for the period ending December 31, 2001. These measures were established as an initial set in the Deputy Secretary's memo of December 3, 1999. This report was developed in coordination with the Office of Environment, Safety and Health (EH) and the Performance Measures Working Group, which consists of representatives from field and program offices, as well as contractor organizations EFCOG and NLIC. This report concludes that current DOE-wide performance has not degraded or significantly improved during the current period based on the five measures.

For each measure, the report provides the following information: 1) DOE-wide corporate performance trend, 2) relative contribution by each PSO, and 3) the current PSO performance in comparison to recent history. This format was initially developed and continues to be improved based on your input.

The Performance Measures Working Group (PMWG) is reviewing additional measures to supplement the initial set to possibly include information on productivity, environment/pollution prevention, effectiveness of event corrective action and/or lost work day case rate. Any candidate measure from this review will be worked through the Program Chief Operating Officers and Field Management Council.

Please advise me of any additional information that you require to effectively evaluate and make sense of the current set of measures. The PMWG is also working to improve the presentation of material and make recommendations on how to most effectively use this information.

Please provide any questions you have on this matter to me at (202) 586-1418.

Attachment 1: ISM Effectiveness Measures Report

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INTEGRATED SAFETY MANAGEMENT (ISM) PERFORMANCE MEASURES REPORT

Prepared by the Department of Energy
Safety Management Implementation Team

with support from the Office of Environment, Safety and Health
and the ISM Performance Measures Working Group

(For Period Ending: December 31, 2000)

ISM PERFORMANCE MEASURES REPORT

This is the ISM Performance Measures Report for the period of October 1 to December 31, 2000. The objective of the performance measures report is to determine whether the ISM objective of "doing work safely" is being achieved. On December 3, 1999, the Deputy Secretary established the following measures as the initial set of ISM performance measures:

- **Total Recordable Case Rate**
- **Occupational Safety and Health Cost Index**
- **Reportable Occurrences of Releases to the Environment**
- **Estimated Radiation Doses to the Public**
- **Worker Radiation Dose**

Three views are provided for each performance measure: 1) DOE-wide performance trend, 2) relative contribution by Program Secretarial Officer (PSO) to the reported quarter of DOE-wide performance, and 3) current performance by PSO compared to historical performance. DOE-wide performance is shown on a control chart, a statistical tool[1] that allows users to view data and determine if there have been any significant changes affecting the results during the time interval reported.

> ***This report concludes that current DOE-wide performance is within control parameters for each of the five measures. DOE performance has neither significantly improved nor degraded during the current report period.***

One of the issues that is encountered when trending PSO data over a period of time is how to deal with the change in facility ownership over the period of consideration. It is possible for PSO performance to change from quarter to quarter due to change in facility ownership but not necessarily due to any actual change in performance at the facility level.

In order to move forward in using the performance measures to evaluate whether the ISM objective of "doing work safely" is being achieved, DOE corporate performance objectives will need to be considered by the Field Management Council based on their review and discussion of this and follow-on reports.

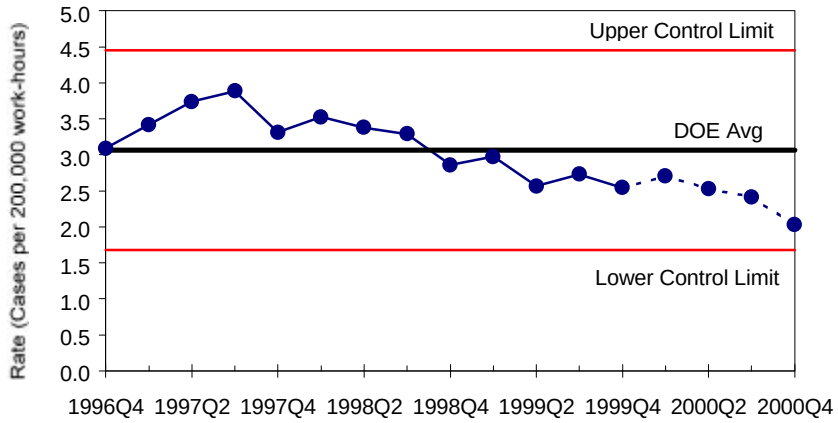
Experience with performance measures indicates that the development and effective use of a mature set of measures requires a multiple year commitment. The set of ISM performance measures and the presentation of this information will continue to evolve as experience is gained. Feedback from responsible line managers on the set of measures and the report format is essential for the evolution of this report to proceed along a meaningful path.

For further information on the performance data please contact:
Sam Rosenbloom (301/903-5749) or Bal Mahajan (301/903-2919)
DOE Office of Performance Assessment and Analysis (EH-3)
e-mail: samuel.rosenbloom@eh.doe.gov - or - bal.mahajan@eh.doe.gov

[1] See Glossary of Terms.

1. Total Recordable Case Rate

Figure 1A: DOE-Wide Performance Trend



Source: CAIRS

DOE SME – Janet Macon (EH-51); 301/903-6096

Data collection period: Quarterly

Definition: Work-related death, injury or illness, which resulted in loss of consciousness, restriction of work or motion, transfer to another job, or required medical treatment beyond first aid, per 200,000 hrs worked. The data includes both contractor and Federal employee cases.

Due to the lag-time in collecting final impact data for the Total Recordable Case Rate (TRC) data (i.e., final days away from work or days of restricted work activity), the last 4 data points are expected to rise. Historically, TRC data are reported as data is received but are continually updated[2]. For the purpose of data analysis, the following focuses on the most complete data - that through CY 1999Q4.

The data indicate that there were no significant changes in system performance for time covered. In CY1999Q4, the total of 754 reportable cases represents a 14.7% decrease in the TRC compared to 884 cases for the same period 1-year prior (CY1998Q4). There were 3,345 total recordable cases for the 12-month period ending December 31, 1999. This data excludes personnel of the Office of Naval Reactors.

The major contributor to the reduction in the TRC Rate has been the decrease in overall reportable cases over the last 4 years.

Figure 1B: Relative Contribution by PSO (Cases for CY2000Q4)[3]

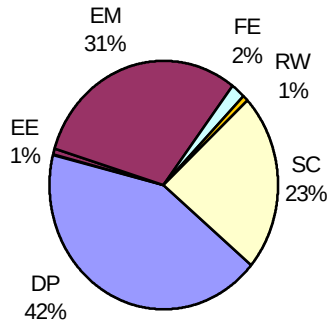


Figure 1C: Performance by PSO (Case Rate for CY2000Q4)

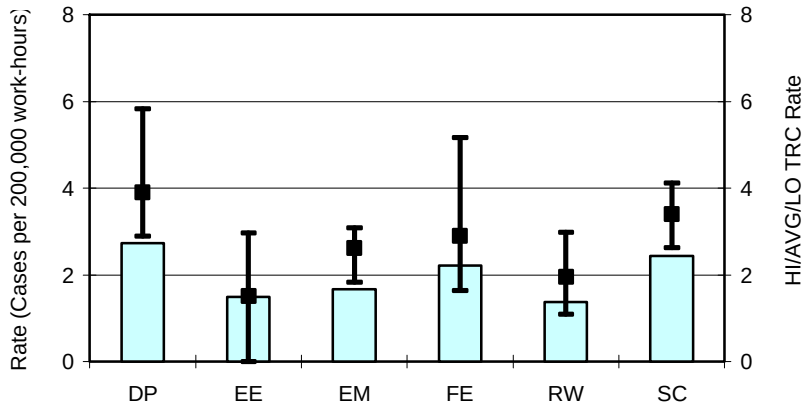


Figure 1C Legend:

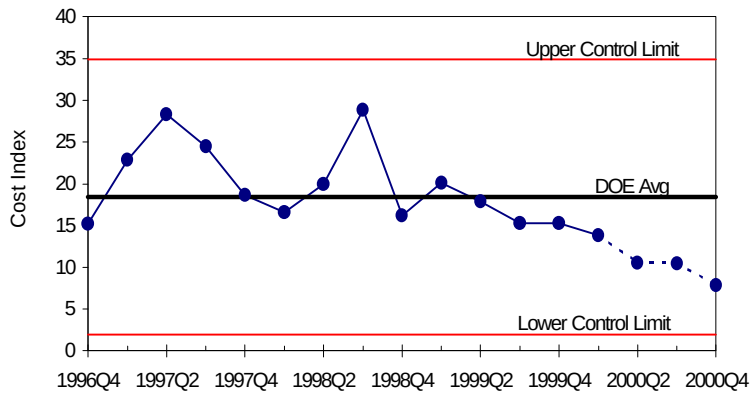
- Bars depict the relative total recordable case rate amongst the PSOs for the reported quarter (CY2000Q4).
- The High Low and Average values are based on the previous 4 years (i.e., CY1996Q4 through CY2000Q3) from the current quarter. The data from the current quarter is expected to rise by as much as 30-40% when finalized.

[2] The best method for representing this data is being evaluated.

[3] The number of cases by PSO was derived from data submitted by reporting organization.

2. Occupational Safety and Health Cost Index

Figure 2A: DOE-Wide Performance Trend



Source: CAIRS

DOE SME – Janet Macon (EH-51); 301/903-6096

Data collection period: Quarterly

Definition: The approximate amount of dollars lost (indirect and direct) per 100 hrs worked for all injuries/illnesses using the following formula. The coefficients used in the Cost Index formula are weighting factors derived from a study of the direct and indirect dollar costs of injuries. The index includes contractor and Federal employee injuries/illnesses. Data excludes The Office of Naval Reactors.

DOE sites use this index to measure improvement in worker safety and health. Due to the lag time in collecting final impact data (e.g., number of days away from work or the number of restricted workdays), the last 4 data points are expected to rise. The index is computed as follows:

Cost Index = 100 {(1,000,000) x D + (500,000) x T + (2,000) x LWC + (1000) x WDL + (400) x WDLR + (2000) x NFC}/HRS

D = *number of fatalities*
T = *number of permanent transfers or terminations due to occupational illness or injury.*
LWC = *number of lost workday cases*
WDL = *number of days away from work*
WDLR = *number of restricted workdays*
NFC = *number of non-fatal cases without days away from work or restricted workdays*
HRS = *number of total hours worked*

Based on the cost index for the year ending December 31, 1999, the approximate dollars lost was $ 40.3 million, a slight reduction of 2.2% from the year ending September 30, 1999.

Figure 2B: Relative Contribution by PSO (Total DOE Cost CY2000Q4)[4]

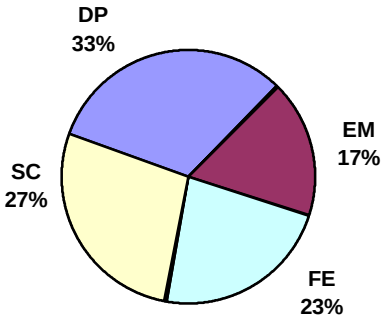
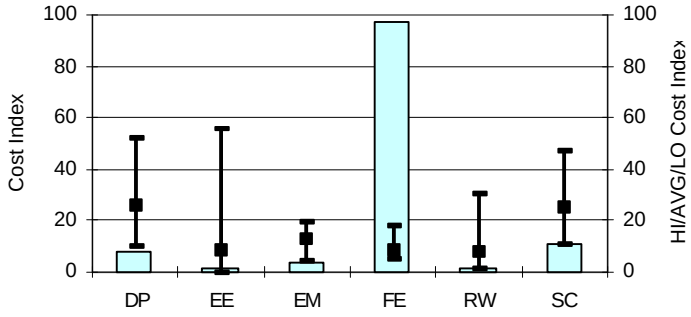


Figure 2C: Performance by PSO (Cost Index for CY2000Q4)



The cost index for FE increased from 4.88 in CY2000Q3 to 97.37 in CY2000Q4 due to a motor vehicle related fatality in November 2000.

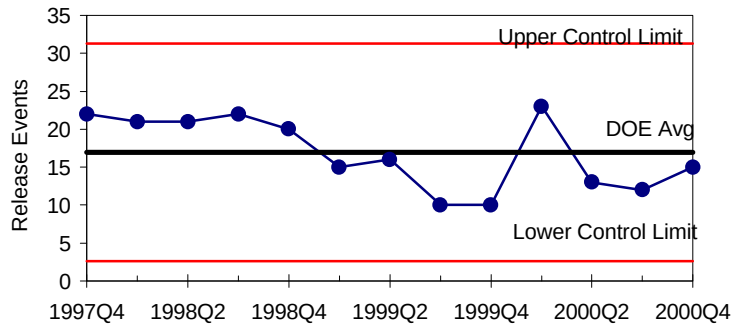
For the purpose of data analysis, the following discussion is based on data through CY1999Q4. The cost index dropped from 15.0 in CY1998Q4 to 14.2 in CY1999Q4, approximately 5.3%.

Legend: The High Low and Average values are based on the previous 4 years (i.e., CY1996Q4 through CY2000Q3) from the current quarter. The data for the current quarter is not complete and can change as much as 30-40% by the time the data is fully complete. This is due to the fact that some data, such as number of days away from work, cannot be known until well after the close of the quarter.

[4] The Cost Index by PSO was derived from data submitted by reporting organization.

3. Reportable Occurrences of Releases to the Environment

Figure 3A: DOE-Wide Performance Trend



Source: ORPS data, based on field office coding of environmental releases

DOE SME – Jeannie Boyle (EH-3); 301/903-3393

Data Collection Period: Daily

Definition: Releases of radionuclides, hazardous substances, or regulated pollutants that are reportable to federal, state, or local agencies. Category 2a and 2b from ORPS data are used and sorted by PSO.

Statistical analysis of the data shows that the system performance is stable from 1997Q4 to the present.

The most recent data (2000Q4) represents a slight but statistically insignificant increase in the number of release events from the prior reporting quarter.

Figure 3B: Relative Contribution by PSO (for CY2000Q4)[5]

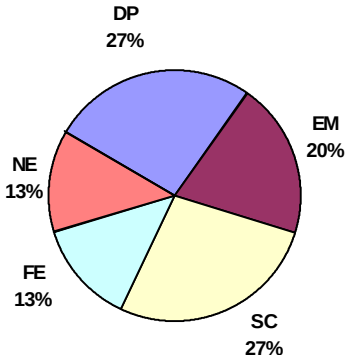
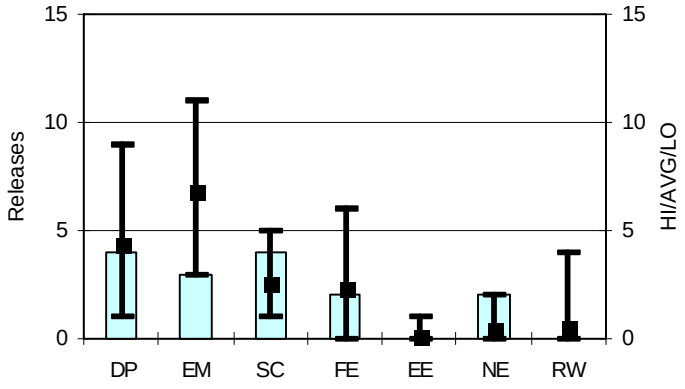


Figure 3C: Contribution by PSO (CY2000Q4)

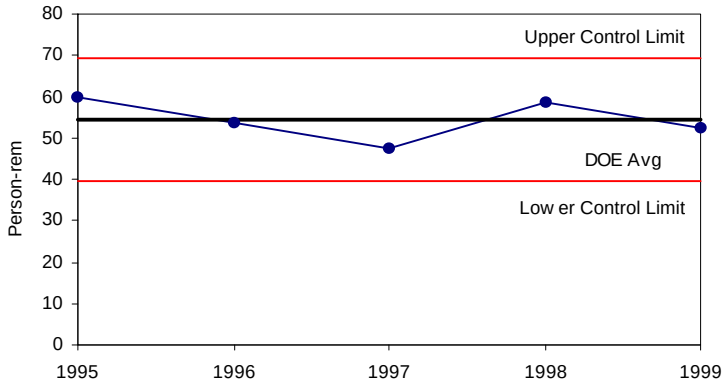


Legend: The High, Low, and Average values are based on 3 years (i.e., 1998Q1 through 2000Q4) of data including the current quarter. The data reflects the number of occurrences and not the number of occurrence reports (a report can contain multiple occurrences). PSOs EE and RW are not presented, as they reported no occurrences during 2000Q4.

[5] Values may reflect the type of work, quantity of work, or variations in state and local reporting requirements.

4. Estimated Radiation Dose to the Public

Figure 4A: DOE-Wide Performance Trend



Source: Annual NESHAPS DOE Site Reports

DOE SME – Gus Vazquez (EH-41)
202-586-7629
Steve Woodbury (EH-41)
202-586-4371

Data Collection Period: Annual – (CY)

Definition: Collective radiation dose (person-rem) to the public within 50 miles of DOE facilities due to airborne radionuclide releases.

DATA UNCHANGED FROM THE June 30, 2000 REPORT

For 1999, the estimated radiation dose to the public was 52 person-rem. The estimated collective dose in 1999 was 10% lower than in 1998. It was lower than the average over the past five years, and significantly lower than the average over the past ten years. More than 70% of the estimated collective dose came from four sites: Oak Ridge, Lawrence Livermore – Site 300, Savannah River, and Brookhaven National Laboratory.

Figure 4B: Relative Contribution by PSO (for 1999)

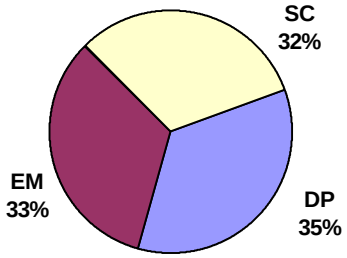
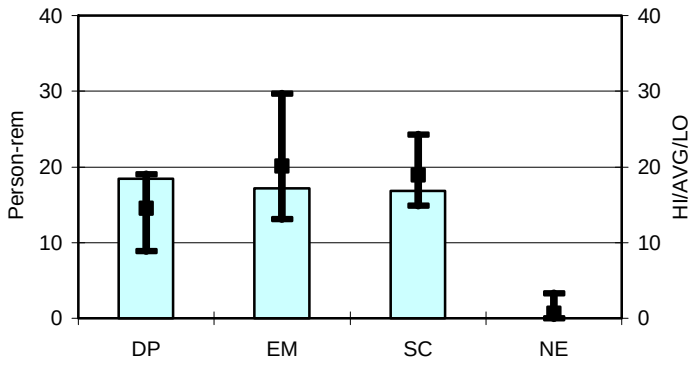


Figure 4C: Contribution by PSO (for 1999)

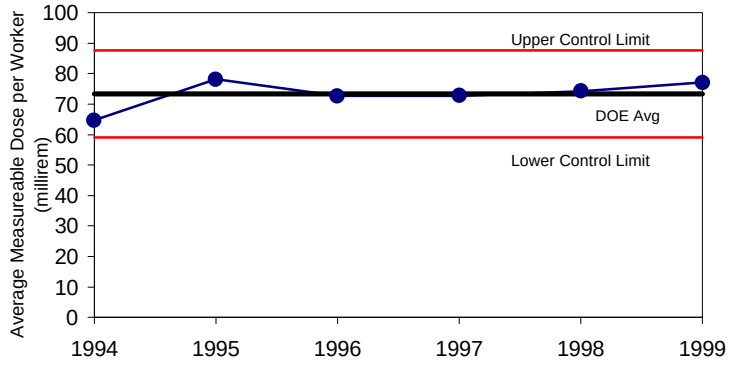


Some individual sites experienced increases or decreases since 1998. Increases resulted from specific activities, which resulted in greater emissions, or in one instance, from conservative modeling assumptions for a new experimental program. Decreases resulted from the conclusion of some specific activities conducted in prior years.

Legend: Blue column represents 1999 data. Hi/Avg/Lo bar represents 5 years of annual data (1995 – 1999).

5. Worker Radiation Dose

Figure 5A: DOE-Wide Performance Trend



Source: Annual Report EH-52

DOE SME – Nirmala Rao (EH-52); 301/903-2297

Data Collection Period: Annual

Definition: Average measurable dose to DOE workers, calculated by dividing the collective total effective dose equivalent (TEDE) by the number of individuals with measurable dose.

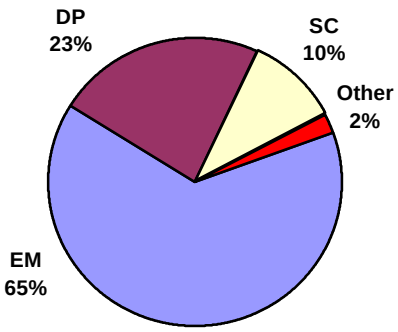
DATA UNCHANGED FROM THE June 30, 2000 REPORT

In 1999, 15% of the monitored individuals (slightly less than 13% of the DOE workforce) received a measurable dose during the past five years. There were no exposures over the DOE limit of five rems.

There has been no significant change in the average measurable dose per worker since 1994.

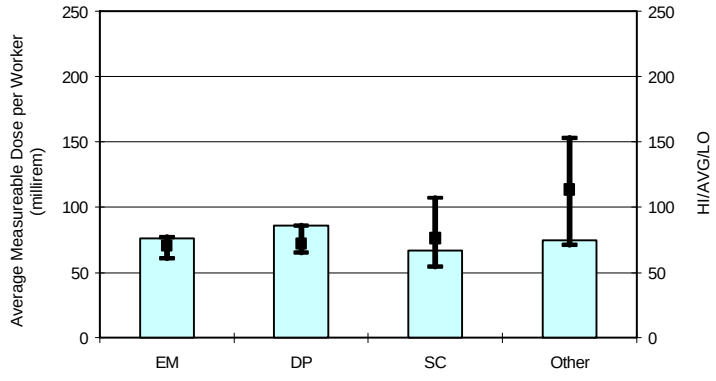
For CY 1999 the total collective worker dose was 1,278 rems, the total number of workers exposed was 16,589 and the number of workers monitored was 112, 745.

Figure 5B: Relative Contribution by PSO (for 1999)



Legend: Percentage is based on total dose for each PSO for 1999 divided by total dose for DOE not normalized for type of work or size of workforce

Figure 5C: Performance by PSO (for 1999)

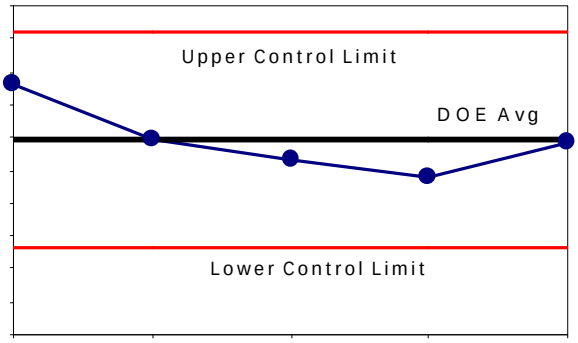


Five contractors (or 4.9% of a total of 103 contractors) contribute 61.3 % of the total collective TEDE. These five contractors are: Rocky Flats Prime Contractors, Flour Daniel Hanford, Lockheed Martin Energy Systems Y-12, Los Alamos National Laboratory, and Westinghouse Savannah River.

Sixty three percent or about 2/3 of the contractors contributes individually less than 1/10 of 1% of the total collective TEDE.

Legend: Blue column represents 1999 data. Hi/Avg/Lo bar represents 5 years of annual data (1995 – 1999).

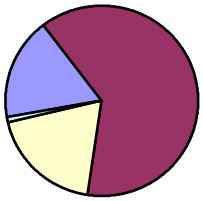
Glossary of Terms

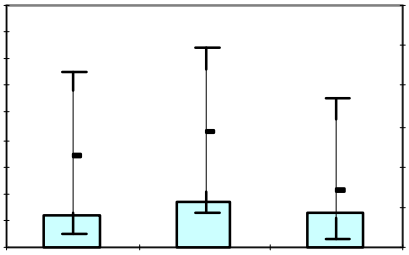


Control Chart - A Control Chart has statistically-generated upper and lower control limits. A process is in statistical control when the process measurements remain within the control limits. This means the variation is consistent and predictable over time. Control limits are computed from process information data[6].

Fluctuations in the data are caused by a large number of minute variations or differences: differences in materials, equipment, the surrounding atmospheric conditions, the physical and mental reactions of people. Most of these differences are extremely small. They cause the pattern to fluctuate in what is known as a "natural" or "normal" manner. Experience shows that there are definite detectable differences between the "natural" and "unnatural" patterns. It is possible to discover and study these differences by means of simple calculations based on well-known statistical laws. This makes it possible to detect, identify and study the behavior of causes[7].

Pie chart - A type of presentation graphic in which percentage values are represented as proportionally sized slices of a pie[8]. Pie charts are used to depict relative contributions of PSOs to overall DOE totals.





Hi/Avg/Lo chart - A type of presentation graphic where Hi/Lo marks indicate how high and low each bar has been during a specific period. The Hi/Avg/Lo chart is used to depict recent performance by PSOs in comparison to historical performance. Comparisons across PSOs must be done with care as the nature of work can vary significantly.

[6] Mark J. Kiemele and Stephen R Schmidt. Basic Statistics: Tools for Continuous Improvement. Air Academy Press, 1990 p. 2-18.
[7] Handbook of Statistical Control, Western Electric Company, 1956, p. 6.
[8] http://e-comm.webopedia.com/TERM/p/pie_chart.html